Title: Neighborhood Math: How Does Your Community Store Add Up?

Link to Outcomes:

- **Problem Solving** Students will demonstrate their ability to work individually and in cooperative groups using pattern problems.

- **Communication** Students will communicate acquired mathematical information to peers and businesses to promote economic growth for students.

- **Reasoning** Students will demonstrate their ability to use reasoning based on evidence of data to build arguments for sharing.

- **Patterns & Relationships** Students will use a variety of manipulatives to construct items in a community which have a pattern relationship.

- **Mathematical Disposition** Students will demonstrate a positive attitude toward mathematics and will value and appreciate the role of mathematics in school, culture, and society.

Brief Overview:

This activity integrates patterns and their relationships with an emphasis on economics in the community. Students will evaluate the economic relationship between neighborhood businesses and the community. Through the use of manipulatives, polls, comparative measures, and writing, students will access what best meets their needs as consumers. The students will determine the level of support contributed by neighborhood businesses.

Grade/Level:

Intermediate Grades 4-6

Duration/Length:

This activity should take approximately 3-4 days; however, it can be extended. The activities on the second and third days may take longer than anticipated.

Prerequisite Knowledge:

The teacher should review patterns, graphs, and data collecting procedures.

Objectives:

The students will be able to:

- identify different patterns.
- construct a graph.
- construct a table and chart.
- use a simulation to solve a problem.
- collect and organize data.
- use writing skills to communicate data.
- use manipulatives to construct patterns.
- read and interpret data.

Materials/Resources/Printed Materials:

- Student worksheets
- Various manipulatives (Pattern Blocks, Learning Links, etc.)
- Craft paper
- Graph paper
- Crayons, colored pencils, markers
- Glue
- Rulers
- Scissors

Development/Procedures:

Day One: *Introduction "What is a Community"*

- As an introduction, ask the students several questions.

  - What items are frequently purchased by students?
  - What goods and services are mostly used by students?
  - When you hear the word "community," what ideas/thoughts come to mind?
  - How would you describe your community?
  - What goods and services are provided by the community?

- Using five different pattern blocks, the students will be divided into cooperative groups to construct two roads using different patterns.

- Provide the students with craft paper, colored markers, pattern blocks, crayons, and scissors.

Ask each group to adhere to the following criteria:

Each neighborhood must contain:

- homes
- a school
- two businesses
- two roads using different patterns for each

- Trace the completed neighborhood on craft paper. The patterned roads must be colored to distinguish the different patterns.

- Each group will share community designs.

- Individual students will record in their journals a description of their community using the patterns observed.

Homework: How could businesses support the school?

Evaluation:

- The teacher will observe group interaction/participation.
- The teacher will evaluate the student's ability to follow directions based on the completed road project.
- The teacher will assess each student's journal entry.

Day Two: *Data Collection, Polling, and Graphing*

- Whole Class Activity:

  - Explore possible options of stores to target.
  - The teacher will poll the students by collecting data of the most frequently purchased items from nearby businesses.

- The teacher will ask the students to predict the most preferred item in each category. The students will write and place these items in a designated box. The winners will be awarded one of the most preferred items.

- Each student will list (on a separate sheet of paper) two of his favorite items from the selected categories. (*Categories may vary*)

- Individual choices will be used to construct a class list.

- Then, the students will record their preferred items on chart paper as a whole class activity.

<u>*Candy*</u>   <u>*Chips*</u>   <u>*Sodas*</u>

- The students will tally the results to determine the most preferred items in each category. The students will construct a form listing the preferred items, and it will be used to collect data from the other classes.

- The teacher will place the students into groups of five (5) with designated responsibilities: Materials person (1), Reporter (1), Clean-Up person (1), and Recorders (2). The designated recorders will poll the other intermediate classes. The remaining students in each group will be working on a pattern problem. (SEE TEACHER'S RESOURCE #1 (TR-1)).

- When the recorders return, the students will tally the results by grade levels to prioritize the results.

- Each group will then formulate a letter informing the business owners of the highly selected items and requesting that the businesses donate a percentage of the sale of preferred items to the school.

Evaluation:

- The teacher will evaluate according to correct graphing format.
- The teacher will evaluate the accuracy of recording student responses.
- The teacher will observe the ability of students to identify patterns (TR-1).
- The teacher will evaluate the task based on the accuracy of students' totals on the organized list.

Day Three: *Pattern Activities Related To Purchase/Sale Of Consumer Items*

- The teacher will divide the students into groups of four.
- The students will receive a set of four (4) Process Problem Solving Cards which must be used collectively to solve a problem. (TEACHER'S RESOURCE #2 & #3)
- Then the teacher will divide the students into two pairs.
- Each pair will be asked to create a set of four (4) Process Problem Solving cards.
- Once each group has created a set of cards, it will be asked to exchange with another group and *Think, Pair and Share*.

Evaluation:

- The teacher will ask the students to share the procedure of problem solving with the class.

Day Four:

- The teacher will divide the students into groups to create their own communities using the following criteria**.** Using five different patterns, students will construct a neighborhood and identify where the patterns exist.
- **Journal Writing Topic:**
  - **"What role should neighborhood business play in the community."**
  - **"What changes should students make in the procedure? Why? How should proceeds from business be used?**

Evaluation:

- A group assessment will be made at the completion of the designed community which encompasses the use of patterns.

Extension/Follow Up:

- Invite store proprietors into the classroom to inform students how proprietors use patterns to set up displays and determine the items they purchase for consumers.

- Students will bring in labels from items in **Lucy's Quick Shop (Teacher Resource #4)** to create their own store. They will be encouraged to explain their patterns of displays and create problems for their classmates evolving from their original store.

Extended Resources:

- **Activities**

  Cooperative Problems Solving with Pattern Blocks
  Creative Publications

  Patterns and Functions (K-9)
  Hands-On, Inc.

  Twenty Thinking Questions for Pattern Blocks
  Creative Publications

  Key Strokes
  Creative Publications

  Mental Math
  by Dale Seymour

  Writing Mathematics
  Nancy Dobbs

  Problem Solving Experiences in Math
  Addison-Wesley

- **Professional Resources**

  Assessment Standards for School Mathematics
  NCTM

  Curriculum and Evaluation Standards for School Mathematics
  NCTM

  How to Use Children's Literature to Teach Mathematics
  by Rosamond Welchman Tischler

Authors:

Kenneth A. Parker
Davis Elementary
Washington, D.C.

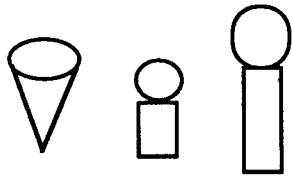Verlene Braxton
Bunker Hill ES
Washington, D.C.

Rosalyn Thompson
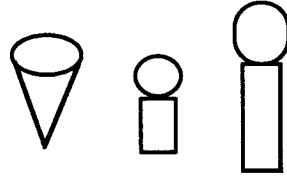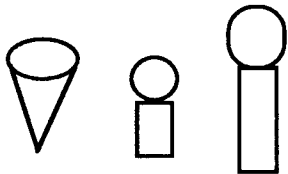Davis Elementary
Washington, D.C.

Activity Problem

Each variety pack of Now 'n Laters candy has three (3) reds, two (2) purples, and one (1) green Now 'n Later. Using this information complete the table below.
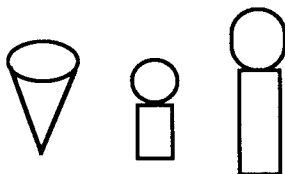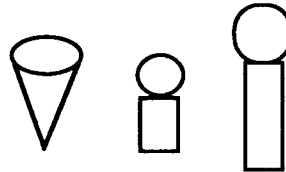
Flavors of Now 'n Laters

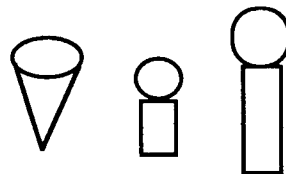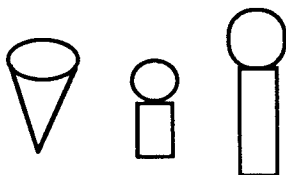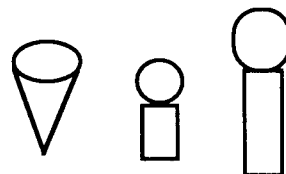|	RED	PURPLE	GREEN
Malik (3 packs)			
Nia (4 packs)			
Imani (5 packs)			
Ayo (6 packs)			
Jose (10 packs)			

On each shelf create a different pattern.

Use the three varieties of cups below to create your pattern.

Represent your pattern in pictures on each shelf

Write on a separate sheet representations of your pattern using letters.

There are five rows of shelves in a store.

Shelves are 1 2 inches apart.

The first shelf is 7 inches from the floor.

At what height should I hang each shelf?

Activity Problem #2

•This activity will be teacher instructed with the whole class.•

Ayana went to a neighborhood store, **Lucy's Quick Shop**. There were three kinds of potato chips on the shelves. The Plain potato chips were labeled $.25, the Barbeque potato chips were labeled $.50 and the larger bags of plain and barbeque potato chips were labeled $.75. Ayana had $3.00. How many different combinations of potato chips could Ayana buy for $3.00?

Students will construct an organized list to work the problem.

$.75	$. 50	$.25

Follow-Up   Activities:

Students will be broken into *THINK, PAIR AND SHARE* groups to do similar activities with drinks and Now 'n Laters.

Drinks — Hugs $.25   Sodas $.45   Juice $.70

Now 'n Laters $.10 $.20 $.30